

numbers (2), (2a) and (2b) are not intended to be drawing reference numerals. Rather, they merely enumerate certain aspects of a gamma determination process for narrative purposes. Therefore, Applicants believe that removal of the item numbers is not necessary, and respectfully request that the Examiner withdraw this objection.

The Examiner also required that all abbreviations in the specification be "deciphered." However, all abbreviations and acronyms in Applicants' specification are well known and widely accepted in the art to which this invention pertains. The use of terminology as ubiquitous as "EEPROM" or "MPEG" would not make the disclosure unclear in any way to those skilled in the color imaging arts. Therefore, Applicants respectfully request that the Examiner withdraw this objection.

Claim Rejection Under 35 U.S.C. § 112

The Examiner rejected claims 6-8, 17-20 and 31-33 under 35 U.S.C. 112, first paragraph, as lacking adequate support in the specification. In this Amendment, Applicants have amended claims 6-8, 17-20, and 31-33 to correct inadvertent errors.

In particular, amended claims 6-8, 17-20 and 31-33 now more properly refer to the display of a *gray* element having red, green and blue values substantially equal to the color value of a selected green element, and a plurality of red-blue shifted *gray* elements having a green value substantially equal to the color value of the selected green element and green and blue values shifted from the color value of the selected green element. In addition, amended claims 6-8, 17-20 and 31-33 now refer to the selection of one of the gray element and the plurality of red-blue shifted gray elements that appears to most closely blend with a dithered *gray* background.

Accordingly, amended claims 6-8, 17-20 and 31-33 now better conform to the *gray* balance estimation process described in Applicants' specification, e.g., at pages 35-37, and are clearly supported and enabled by Applicants' disclosure pursuant to the requirements of 35 U.S.C. 112, first paragraph. In view of the amendments, Applicants respectfully request withdrawal of the rejection under 35 U.S.C. 112, first paragraph.

Claim Rejections Under 35 U.S.C. § 103

In the Office Action, the Examiner rejected claims 1, 4-5, 9-13, 26, 29-30 and 34-38 under 35 U.S.C. 103(a) as being unpatentable over Engeldrum et al. (U.S. 5,638,117) in view of Hill et al. (U.S. 6,243,070); rejected claims 2-3, 15-16, 21-25, 27-28 under 35 U.S.C. 103(a) as being unpatentable over Engeldrum et al. and Hill et al. in view of Seegers et al. (U.S. 6,439,722); and rejected claims 14 and 39-40 rejected under 35 U.S.C. 103(a) as being unpatentable over Engeldrum et al. and Hill et al. in view of Graf et al. (U.S. 6,349,300 B1). Applicants respectfully traverse these rejections.

In support of the rejections, the Examiner cited Engeldrum et al. as disclosing a method that involves characterization of gamma for red, blue and green channels of a display device based on an estimated gamma. In addition, the Examiner stated that Engeldrum et al. discloses modifying gamma based on a gray balance evaluation for the red and blue channels.

The Examiner acknowledged that Engeldrum et al. fails to disclose estimating an initial gamma for a display device based on selection of a displayed green element that appears to most closely blend with a dithered green background. However, the Examiner cited Hill et al. as teaching "why an initial (preliminary) gamma [is] done with the green color" and "how green background overlaid by a number of closely spaced black lines is used."

The Examiner further recognized that neither Engeldrum nor Hill et al. contemplates the use of a dithered green background, as claimed, but apparently dismissed this limitation on the basis that Applicants did not emphasize its "criticality."¹ The Examiner concluded that it would have been obvious to modify the Engeldrum et al. method in view of Hill et al. to use a green background for gamma estimation "in order to display color images accurately and clearly."

These rejections are improper. Neither Engeldrum et al. nor Hill et al. discloses or suggests the inventions defined by claims 1-40. The applied references also fail to provide any teaching that would have suggested the desirability of modification to arrive at the claimed inventions.

¹ Applicants are unaware of any legal authority that would permit the Examiner to summarily disregard a limitation because Applicants did not discuss its "criticality." A limitation, whether critical or not, still must be suggested in the prior art to support a prima facie case of unpatentability.

The Examiner has misinterpreted the scope and content of the Engeldrum et al. and Hill et al. references. Moreover, the Examiner appears to have relied on a reconstruction of the claimed invention in view of the teachings contained in Applicants' own disclosure, which is impermissible. For these reasons, the Examiner has not established a prima facie case of obviousness.

For example, it appears that the Examiner misinterpreted the Engeldrum et al. reference. As acknowledged by the Examiner, Engeldrum et al. does not suggest estimation of an initial gamma for a display device based on selection of a displayed green element that appears to most closely blend with a dithered green background, as required by claims 1-40. Engeldrum et al. also fails to disclose, however, a characterization of overall gamma for the red, blue, and green channels based on the gamma estimated from the green element, as set forth in the claims.

Rather, contrary to the Examiner's interpretation, Engeldrum et al. clearly indicates that "*separate gamma . . . determinations are performed for red, green and blue components*" (emphasis added). Engeldrum et al., Col. 3, lines 53-56. This difference is clearly at odds with the requirements of Applicants' claims. In particular, Engeldrum et al. does not suggest characterization of overall gamma for red, blue, and green based on the gamma estimated from the green element. Therefore, the rejection is improper and should be withdrawn.

In addition, Engeldrum et al. does not teach modifying the overall gamma based on a gray balance evaluation for the red and blue color channels, as set forth in Applicants' claims. As discussed above, Engeldrum does not even produce a characterization of overall gamma. Instead, Engeldrum et al. makes separate gamma determinations.

Hence, to the extent Engeldrum et al. describes any modifications based on gray balance, such modifications are necessarily made with respect to the separate gammas, rather than an overall gamma for red, green and blue channels, as claimed by Applicants. In view of this difference, the rejection is improper and should be withdrawn.

The Examiner also overstated the Hill et al. teachings. Indeed, Hill et al. does not even discuss gamma estimation. Accordingly, it is difficult to imagine how one of ordinary skill in the art would have been considered the Hill et al. teachings relevant to the Engeldrum et al. method. Hill et al. makes only a single mention of gamma in the context of gamma *correction* using *stored* gamma values that have already been provided for individual display devices. Hence, Hill

et al. provides no teaching pertinent to the estimation of gamma values in the Engeldrum et al. method. Instead, Hill et al. is directed to techniques for alleviating color artifacts between RGB pixel sub-components on a display device.

As noted by the Examiner, Hill et al. discusses the sensitivity of the human eye to different colors. In particular, Hill et al. discusses the well known fact of color science that green is the most dominant and intense color among red, green, and blue. However, the Examiner has attributed undue significance to the Hill et al. teachings. The Examiner's contention that Hill et al. "shows why an initial (preliminary) gamma done with the green color" would have been desirable is completely outside the scope of the Hill et al. reference and clearly takes into account Applicants' own disclosure.

Hill et al. makes absolutely no mention of the desirability of characterizing overall gamma for red, blue and green channels based on an initial gamma that is estimated based on selection of a displayed green element that appears to most closely blend with a dithered green background, as claimed. The gap between an elementary fact of color science and the specific gamma estimation process defined by Applicants' claims is simply unbridgeable based on the references applied by the Examiner. Therefore, Applicants respectfully submit that the rejection is improper and should be withdrawn.

The motivation cited by the Examiner for such a modification also seems to make no sense. The Examiner asserted that modification of the Engeldrum et al. method in view of Hill et al. would have been obvious "in order to display color images accurately and clearly." However, the Examiner did not explain how such a modification would lead to heightened accuracy and clarity. Hill et al. makes no mention of any accuracy or clarity advantages stemming from such a modification. Moreover, it is unclear to Applicants how increased accuracy and clarity would even result from the modification to the Engeldrum et al. suggested by the Examiner. Accordingly, the motivation for one of ordinary skill in the art to undertake such a modification seems to be suspect.

For at least the reasons set forth above, Applicants respectfully submit that the Examiner has not established a prima facie case of unpatentability with respect to claims 1-40. Seegers et al. and Graf et al. provide no additional teachings sufficient to cure the basic deficiencies evident

in Engeldrum et al. and Hill et al. In view of the fundamental differences discussed above, Applicants reserve comment concerning the further patentable limitations set forth in the claims.

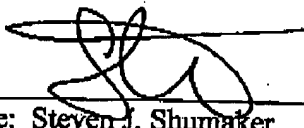
All claims in this application are in condition for allowance. Applicant respectfully requests reconsideration and prompt allowance of all pending claims. Please charge any additional fees or credit any overpayment to deposit account number 50-1778. The Examiner is invited to telephone the below-signed attorney to discuss this application:

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1-17-03

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VERSION SHOWING CHANGES PURSUANT TO 37 CFR § 1.121(c)(ii)

IN THE SPECIFICATION:

This application claims priority from U.S. provisional application serial no. 60/193,725, filed March 31, 2000, U.S. utility application serial no. 09/631,312, filed August 3, 2000, and U.S. provisional application serial no. 60/246,890, filed November 1, 2000, the entire content of each being incorporated herein by reference.

IN THE CLAIMS:

6. (Amended) The method of claim 1, further comprising:
displaying a gray element having red, green and blue values substantially equal to the color value of the selected green element with the display device;
displaying a plurality of red-blue shifted gray elements having a green value substantially equal to the color value of the selected green element and green and blue values shifted from the color value of the selected green element with the display device;
selecting one of the selected ~~green~~ gray element and a ~~the~~ plurality of red-blue shifted gray elements displayed by the display device that appears to most closely blend with the a dithered ~~green-gray~~ background displayed by the display device; and
estimating the gray balance of the display device based on the selected one of the selected ~~green-gray~~ element or selected red-blue shifted gray element.
7. (Amended) The method of claim 6, wherein the red-blue shifted gray elements represent shifts in red, blue, or a combination of red and blue away from the color value of the gray selected ~~green~~ element.

8. (Amended) The method of claim 6, wherein the red-blue shifted elements do not represent any substantial shift in green away from the color value of the ~~selected green~~ gray element.

17. (Amended) The system of claim 15, wherein the color profiling process includes:
displaying a gray element having red, green and blue values substantially equal to the color value of the selected green element with the display device;

displaying a plurality of red-blue shifted gray elements having a green value substantially equal to the color value of the selected green element and green and blue values shifted from the color value of the selected green element with the display device;

estimating the gray balance of the display device by selecting one of the ~~selected green~~ gray elements and a ~~the~~ plurality of red-blue shifted gray elements displayed by the display device that most closely blends with the ~~a~~ dithered gray background displayed by the display device;

generating a color profile for the display device based on the estimated gamma, and the estimated gray balance; and

modifying the color image for the display device using the color profile.

18. (Amended) The system of claim 17, wherein the color profiling process includes:

displaying a gray element having red, green and blue values substantially equal to the color value of the selected green element with the display device;

displaying a plurality of red-blue shifted gray elements having a green value substantially equal to the color value of the selected green element and green and blue values shifted from the color value of the selected green element with the display device;

selecting one of the ~~selected green~~ gray element and a ~~the~~ plurality of red-blue shifted gray elements displayed by the display device that appears to most closely blend with the ~~a~~ dithered green-gray background displayed by the display device; and

estimating the gray balance of the display device based on the selected one of the selected ~~green~~ gray element or selected red-blue shifted gray element.

19. (Amended) The system of claim 18, wherein the red-blue shifted gray elements represent shifts in red, blue, or a combination of red and blue away from the color value of the selected green-gray element.

20. (Amended) The method system of claim 18, wherein the red-blue shifted gray elements do not represent any substantial shift in green away from the color value of the selected green-gray element.

31. (Amended) The computer-readable medium of claim 26, wherein the instructions cause the processor to:

display a gray element having red, green and blue values substantially equal to the color value of the selected green element with the display device;

display a plurality of red-blue shifted gray elements having a green value substantially equal to the color value of the selected green element and green and blue values shifted from the color value of the selected green element with the display device;

select one of the selected green-gray element and a the plurality of red-blue shifted gray elements displayed by the display device that appears to most closely blend with the dithered green-gray background displayed by the display device; and

estimate the gray balance of the display device based on the selected one of the selected green-gray element or selected red-blue shifted gray element.

32. (Amended) The computer-readable medium of claim 31, wherein the red-blue shifted gray elements represent shifts in red, blue, or a combination of red and blue away from the color value of the selected green-gray element.

33. (Amended) The computer-readable medium of claim 31, wherein the red-blue shifted gray elements do not represent any substantial shift in green away from the color value of the selected green-gray element.